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PATENT APPLICATION

of

Ronald Coleman

for

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AMUSEMENT AND ALERT ACCESSORY FOR BICYCLES

RELATIONSHIP TO OTHER APPLICATIONS

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This application claims the benefit of US Provisional Patent Application No. 60/429,266 filed November 26, 2002, which is hereby incorporated by reference in its entirety.

FIELD OF THE INVENTION

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The present invention relates to an accessory for bicycles. More particularly the present invention relates to the sound generating device for amusement and or safety of bicyclists and others nearby.

BACKGROUND OF THE INVENTION

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Bicycles are being increasingly used for recreation in parks or bike trails. Commuting to school and work adds to rising numbers of bicyclists on busy streets in communities. Bicycles used by messengers and police officers raise safety as well as occupational concerns when used in metropolitan areas, or in areas with heavy pedestrian traffic. In all circumstances, there is a need to alert others to the presence of cyclists.

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As the number of bicyclists rises, so does the number of related accidents. Accidents involving children present a very serious problem. Over 400,000 children, of the ages

14 and under, are treated in emergency rooms for bicycle related injuries each year. Death involving older bicyclists is also an increasing problem. Last year 65 percent of casualties involved cyclist, 55 and older. On the pedestrian side, the senior major complaint of the senior citizens involved in bicycle accidents is they didn't see or hear the cyclist.

Attempts by municipalities to address bicycle accidents have resulted in ordinances that make it mandatory for bicyclists utilizing urban trails, to have an audible alert device with a range of at least 100 feet.

There is clearly a need for bicycle accessories to be developed that provide safety benefits as well as fun to users.

Nostalgia appears to be the overriding factor for inventors when accessories were introduced to produce sound effects. Typically, amusement devices for bicycle wheels consist of decorative materials interlaced through the spokes, or reflective materials mounted on spokes, or noise making devices such as playing flappers, reeds, or balloons that mount on the fork of a bicycle and extend into the moving path of the spokes to produce a noise as the wheel rotates.

However, the prior art noise making accessories have numerous problems. Traditional bicycle bells, horns and clappers are most often barely audible and are difficult to use while maintaining good riding form. The accessories are most often difficult to install, especially by children or adults who may have limited mechanical skills. This is especially problematic for devices, which requires substantial pressure to assemble and/or clamp the accessory securely to a bicycle. If the device is not sufficiently well secured, slippage and rotation of the accessory around the fork or frame during riding potentially allows the device to bind the wheel of the bicycle. Also, most prior art accessories are made of metal, which may be heavy and have potentially dangerous sharp edges. Alternate material noisemakers such as flappers, balloons and reeds tend to wear out or are destroyed after mammals use. Additionally, flaps, flappers, and balloons designed to be engaged in the spokes of a wheel, may not be attached with sufficient security to the bicycle and are easily dislodge during use. Further, prior art noisemakers cannot produce realistic, motor like sounds. The above is a brief listing of the number of problems associated with many of the prior art devices; however, other disadvantages may also exist.

For example, US patent No. 5,226,846 to Onori discloses a device similar to a clothes pin, which has a flapper held in a groove in each tip. In order to hold the flapper during the vibrations associated with use the groove will necessarily fit the flapper tightly, or the cord will be adhered to the clip, either of which will preclude removal and replacement of

the flapper. The device itself is held in place by gripper inserts, which are deformable. When exposed to inclement weather and/or direct sunlight, these types of materials began to break down and quickly become brittle. Once the material has become brittle, relatively minimal force would be required to dislodge the device causing the device to move freely along the member to which it is attached. The device with no longer produce the sound effect desired and could potentially jam the wheel.

SUMMARY OF THE INVENTION

In keeping with the foregoing discussion, the objective of the present invention is to provide an alerting device for bicycles, which is quickly and easily attached to a bicycle. Optimally, the device may be assembled and installed with minimum force, pressure or strength while using a single tool or even without tools. The device generates the sound during use of the bicycle, which alerts anyone nearby that there is a bicycle in motion.

A further objective of the present invention is to provide a unit constructed primarily of durable, but safe material such as high impact plastic. The sound producing elements are also preferably constructed of durable materials, which increase or maximize the length and quality of play.

Yet another objective of the present invention is to provide device with dimensions, component arrangements, and orientation of the accessory on the frame, which minimizes the potential for the device to jam or wedge into the wheel assembly.

Another objective of the present invention is to provide a device having interchangeable sound producing elements to allow a user to choose the sound produced by the accessory. Optimally, the user would also be able to obtain replacement flappers for flappers, which are worn, damaged, misplaced or otherwise unusable.

A further objective of the present invention is to provide an accessory housing and locking mechanisms which allow the user to engage and disengaged the sound producing element assembly in an easy and reliable manner, thereby allowing the user to exchange the sound producing flapper for different sound producing flapper, or to remove the flapper entirely to interrupt operation of the present invention without having to remove the entire device from the bicycle.

Yet another objective of the present invention is to provide an accessory, which can be attached to a variety of locations on bicycle, wheelchair, or other wheeled devices or vehicles.

Another objective of the present invention is to provide device which can be installed and aligned so that one or more accessories can be used in unison on a single frame member, opposing frame members, or at different locations on the bicycle.

member, opposing frame members, or at different locations on the bicycle.

In keeping with these objectives, the present invention takes the form of an amusement and engineering counter measure designed to enhance fun and aid in the reduction of collisions between vehicles or vehicles and pedestrians. The accessory, when properly mounted, produces distinct sounds, in order to alert others of presence of a bicycle or other vehicle. The accessory is formed of a bicycle mounting assembly and a flapper assembly. The bicycle mounting assembly clamps around a member near either the front or rear wheel of a bicycle. The flapper assembly interchangeably attaches a flapper to the bicycle mounting assembly. When fully installed, the flapper is disposed within the spokes of the bicycle wheel. Therefore, when the bicycle is in motion the spokes impact the flapper producing a sound. Depending on the configuration and size of the flapper, different sounds and sound intensities are produced.

The accessory may also be viewed as a children's toy designed for fun. The amusement aspect of invention enhances the play value and increases enjoyment derived from riding bicycles and using wheelchairs, expressly for the young.

As a safety aid, the accessory acts as a visual and audio alert for children, seniors, or people who commute by bike or wheelchair to shop, work, or appointments.

Bicycle messengers and bicycle police currently rely primarily on reflexes to avoid most crashes. As an occupational alert aid, the device installed on a bicycle will alert a motorist, pedestrian or other bicyclist to the presence of a cyclist if the bicycle is equipped with the accessory of the present invention.

Other objects and advantages of the invention will no doubt occur to those skilled in the art upon reading and understanding the following detailed description along with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a front view of a bicycle front fork with the accessory attached

Figure 2 is a top view of the accessory of the present invention

Figure 3a is a left side view of accessory

Figure 3b is a front view of accessory

Figure 3c is a an exploded view of accessory

Figure 3d is a a top view of accessory

Figure 3e is a plan view of accessory

Figure 4a is an exploded view of an alternate configuration of accessory

Figure 4b is a top view of accessory

Figure 4c is a top view of bicycle mounting clamp enclosure assembly

Figure 4d is top view of flapper mount assembly

Figure 4e is side view of accessory

Figure 4f is plan view of bicycle mounting clamp enclosure assembly

Figure 4g is plan view of flapper mount assembly

5 Figure 5a shows different sizes of flappers

Figure 5b show alternate configurations of flappers

DETAILED DESCRIPTION

10 Figure 1 is a front view of amusement and alert accessory device 20 of the present invention installed on a bicycle 22. The present invention is formed of two assemblies: a bicycle mounting clamp enclosure assembly 30 and a flapper mount assembly 50. Figure 2 is a top view of the amusement and alert accessory device 20. In figure 1, the bicycle accessory 20 is shown attached to one of the prongs 24 of the fork 26 of a bicycle

15 frame 28. Interchangeably attached to the bicycle mounting assembly 30 is the flapper mount assembly 50. The flapper 52 of the flapper mount assembly 50 extends from fork 26 inward into the path of the spokes 23 of the wheel 25 of the bicycle 28. As the wheel 25 spins during motion of the bicycle 22, the spokes 23 hit the flapper 52 and create a noise. The noise made varies depending on the size, configuration, installation location, and

20 materials used to construct the flapper 52. The sound is repeated at a frequency proportional to the speed of the rotation of the wheel 25.

In a preferred embodiment, the bicycle mounting clamp enclosure assembly 30 is formed of one or more clamp members 32, a threaded insert 34, a screw 36, and an enclosure 38 configured to accept a flapper mount assembly of the accessory. The clamp

25 32 is configured to fit around the prong 24 of bicycle frame 28. The screw 36 passes through hole 40 in one side of clamp 32 and into threaded insert 34. The device 20 is coupled to the prong 24 by tightening the screw 36, which reduces the inner diameter of the clamp 32 causing the clamp 32 to tightly grip the prong 24. Attached or integral to the side of the clamp 32 is an enclosure 38. In a preferred embodiment, clamp 32 threaded

30 insert 34 and enclosure 38 are manufactured as a single, integrated unit or can be separately manufactured and pre-assembled into a single unit, which is then bonded together. The bonding may be by ultrasonic means, liquid or other welding, gluing, or other adhesive means or mechanical connections. An alternate version of the bicycle mounting clamp enclosure assembly 30 has threads molded into one side of the clamp 32 for engagement with a threaded member. If preferred, the mounting clamp/enclosure

35 assembly 30 may be adhered together by the user during the installation process. The internal components of the enclosure 38 may include alignment post, grooves, stops,

guides, standoffs, detents and cutouts that are positioned to properly orient mating parts and to provide means to engage, disengage, secure and lock flapper mounting assembly 50 in enclosure 38 of bicycle mounting clamp enclosure assembly.

5 The mounting assemblies may be formed of plastics (such as ABS, polycarbonate, delrin, or nylon) or other durable materials. High impact resistant, durable materials are preferred. The surface of bicycle mounting clamp enclosure assembly may be reflective, fluorescent, painted, or displayed other characteristics to enhance visibility or aesthetics. Generally, the flapper mount assembly 50 functions to permit rapid and simple assembly and replacement of sound producing flapper 52. In addition, the internal component
10 arrangement allows vibration from the flapper 52 to resonate in the enclosure 38.

The flapper mount assembly 50 is formed of left 56 and right 54 flapper mounts, and sound-producing flapper(s) 52, as shown in figure 2. In the embodiment shown, flapper 52 has three holes 59 along one edge. The three holes 59 align the flapper 52 with the flapper mounts. Holes 59 in left flapper mount 56 are lined up and placed over posts 58
15 on the right flapper mount 54. The left 56 and right 54 flapper mounts are pressed together to trap one or more flappers 52, forming the flapper mount assembly 50. In an alternate configuration, sound producing elements may also be permanently attached to flapper mounts by use of screws, rivets, bolts, adhesives or other attachment means.

Extending from a portion of the flapper mount assembly 50 is an assembly or
20 attachment means. In the present embodiment the attachment means is by an interlock system formed by channels and structures, which mate with guiding channels in the bicycle mounting clamp enclosure 38. The flapper mounting assembly 50 is received within a channel of enclosure 38 thereby aligning the components of the flapper mount assembly 50. Although not required, the channel in the enclosure 38 is
25 preferably symmetrical, thereby allowing the user to place the flapper mount assembly 50 in the enclosure 38 from top or bottom directions. In the embodiment shown, there are grooves along edges of the flapper mount assembly 50 and corresponding raises within the channel of the mounting clamp enclosure 38 that allow the flapper mount assembly 50 to be advanced into enclosure 38. The flapper mount assembly 50
30 also has a sloped configuration to form a projection point outward. When the user inserts the flapper mounting assembly 50 into the enclosure 38, the slope of the flapper mount assembly 50 and the internal channel dimensions of the enclosure 38 create an interference fit that lock the mating parts together. When seated within the enclosure 38, a raised projection or detent on the flapper mount assembly 50 interlocks within a
35 depression or hole within the enclosure 38, thereby locking the flapper mount assembly 50 to the bicycle mounting clamp enclosure assembly 30.

When the user wishes to remove the flapper assembly 50 from the bicycle mounting assembly 30, the user simply withdraws the flapper mount assembly 50. In alternate embodiments, other types of attachments such as snaps, buckles, ties, or other attaching methods may also be used to secure the flapper mount assembly in the enclosure 38.

In another embodiment, shown in figure 3a-d, the accessory consists of screw 36 threaded insert 34, washer 33, clamp 32, and a hinged flapper mount 57. The clamp 32 and hinged flapper mount 57 may be manufactured as a single, integrated unit. The clamp 32 is configured to fit around the prong 24 of a bicycle frame 28. The hinged flapper mount cover 57 contain posts 58 designed to align and secure sound producing flapper 52 within the mount 57. Holes 59 in the flapper mount 57 are dimensioned to mate with posts 58 of the hinged flapper mount 57. When the hinged flapper mount 57 is closed, a screw knob 55 is utilized to secure the sound-producing flapper 52.

In yet another embodiment, figures 4a-g show a bicycle mounting clamp enclosure assembly 30 constructed of components consisting of one or more clamp members 32, a threaded insert 34, screw 36, and enclosure housing 38. In this embodiment, components may be separately manufactured and pre-assembled into a single unit, which can then be bonded together by use of ultrasonic welding, adhesive means or mechanical connections. If preferred, the bicycle mounting clamp enclosure assembly 30 may contain posts 71 holes 72 that mate and may be adhered together by the user during the installation. Internal and external structures of the bicycle mounting clamp enclosure 30 may include alignment post, grooves, stops, guides, standoffs, detents, or cutouts that are positioned to properly orient mating parts and to provide means to engage, disengage, secure and lock flapper mount assembly 50 in enclosure 38.

The flapper mounting assembly 50 of embodiment is composed of a hinged flapper mount assembly 57, with one side containing posts 58 designed to secure sound producing flappers 52 in the hinged flapper mount assembly 57. Holes 59 in the opposing surface of the flapper mount assembly are dimensioned to mate with posts 58 to secure one or more sound-producing flappers 52. A spring 64 may be attached to a snap button release 63 to allow the flapper mount assembly 50 to be engaged and disengaged from the enclosure 38. When the snap button is depressed, flapper mount assembly 50 can be advanced into or withdrawn from the enclosure 38 of the mount clamp assembly.

In an alternate embodiment wherein, the bicycle mounting clamp enclosure assembly may consist of a bracket that is welded or formed onto a fork of a bicycle frame during the bicycle manufacture process. In this configuration, the bracket is integral with the enclosure. The components and functions of the flapper mount assembly and internal enclosure structures are the same as previously described.

In yet another embodiment, the flapper mount assembly is molded around a sound-producing flapper to form a one-piece assembly which is advanced into the bicycle mounting clamp enclosure channel to be locked and secured in the enclosure utilizing a button snap release as previously described.

5 The bicycle mounting assembly of the present invention is shown attached to the right side of the fork of the bicycle, however the device may also be attached to the left side of the bicycle fork, the rear seat stay, the rear chain stay, the right front fender brace or the rear fender brace or any other structure which is proximate the spokes of a wheel.

10 The bicycle mounting assemblies shown may have smaller clamps configured and intended to mount on a seat stay of the frame at the rear of the bicycle, thereby interacting with the rear spokes of the bicycle.

 Depending on the size and configuration of the flapper assembly and the bicycle mounting assembly, sections of the device may be hollow for weight and material saving considerations, or the entire device may be solid to provide optimal strand. Connections and attachments are designed and formed accordingly.

15 Flappers shown in Figure 5a are flexible, durable forms that generate sounds as accessory strikes the spokes of velocipede or other vehicle. Flappers are designed for quick insertion and removal and the shapes are integrated with the flapper mount assembly to create an appealing appearance. Conditions of use require the flappers to be impact resistant in order to withstand repeated impact with spokes of a wheel, weather resistant to endure extremes of heat from sun, or winter conditions such as rain or snow.

20 The shape of the flappers shown in these figures produces sound similar to a motor. The amount of noise made by flapper varies by the size and material composition of the flapper. The texture of the surface as well as the internal structure of the flapper can be varied to produce different sounds.

25 The flappers may be composed of plastic, paper, rubber, rigid foam, fiber, metal, or suitable material and/or coated with materials such as plastic, paper, etc. Alternately, a light reflective material may be used to form the flapper, or a light reflective material may be added to the surface of the flapper, to provide a visual alert as to the location of the bicycle. Alternate embodiment of the flappers shown in Figure 5b may be multi-layered, corrugated, or contain hollow portions, nodules, bumps. When positioned in the path of the spokes of a bicycle, the flapper produces is a sound as the wheel rotates.

30 When the sound producing elements is in the "engaged" positioned, impact from the

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spokes of a wheel onto the flapper will produce a predetermined sound. Sound elements can be readily removed or into changed user utilizing the mounting assembly and simple tools. This capability allows the user to select from a variety of predetermined sounds.

5 The sound producing elements may be from the variety of thicknesses (.001 -.020), widths (1-4"), and lengths (1.5 to 4"). Other dimensions may also be used depending on the desire of the user and the sound that is to be produced.

10 In the preferred embodiment of the present invention, when assembled and installed, the flapper is placed about midway between the center of the wheel and the rim of the wheel. Preferably, the flapper extends to a point just short of centerline of the tire. This assures that even if flappers are placed on both prongs, they will not interfere with one another or with operation of the bicycle. Depending on the desire of the user, however, the flapper may extend farther or not as far into the path of the spokes, or the flapper may be placed closer or very near either the center of the wheel or the outer edge of the rim near the tire.

15 The flapper mount assembly and bicycle mounting clamp enclosure assembly of the device may have other graphic treatments such as pictures, designs, patterns, geometric or non-geometric shapes, trademarks of branded products, team logos, decals, etc. added to the surface to enhance the appearance of the accessory or for advertising purposes.

20 Although the examples given include much specificity, they are intended as illustrative of only one possible embodiment of the invention. Other embodiment and modifications will, no doubt, occurred to those skilled in the art. For example, the embodiment disclosed described the accessory mounted on the frame of the bicycle, however, the device may also be designed for and mounted on other wheel devices such as bicycles, wheel chairs, trucks, motorcycles, skates, skate boards, other vehicles, etc. In addition, 25 bicycle manufacturers can configure any or all of the embodiments described for use during frame manufacture. Thus, the examples given should only be interpreted as illustrations of some of the preferred embodiment of the invention, and the full scope of the invention should be determined by the appended claims and their legal equivalents.